

REMARKS

Claims 1 and 3-10 are pending in the present application. Claims 6-10 are newly added.

Claim Rejections - 35 U.S.C. § 103

Claims 1 and 3-5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over **Hamrock** (US 6,063,522) in view of **Sano** (US 2002/0086191) and **Funatsu** (US 5,478,673). Favorable reconsideration is requested.

(1) Applicants respectfully submit that the present invention as recited in the claims would not have been obvious over Hamrock in view of Sano and Funatsu because the present invention as recited in the claims provides unexpected results over the cited references.

Attached with this Amendment is a declaration under 37 C.F.R. § 1.132 providing additional data for demonstrating the unexpectedly improved results of the present invention as recited in the claims.

As described in Table 1 of the additional data, solvent ratios in additional Comparative Examples 6-8 (main: subsidiary = 85:15 to 80:20) correspond to the medium between a solvent ratio in Comparative Example 5 (main: subsidiary = 70:30) and solvent ratios in Example 1, 3-8 (main: subsidiary = 100:0 to 90:10).

In the Comparative Examples which are not within the claimed range, the cell swellings are 2.51-3.25mm. By contrast, in the Examples which are within the claimed range, the cell swellings are significantly small (0.15-1.00mm). Furthermore, while discharge capacities are 72-77 in the Comparative examples, discharge capacities in the Examples are larger (82-103).

Moreover, comparing the trend of Graphs 1 and 2 in the Comparative examples with the

trend of Graphs 1 and 2 in the Examples, both Graphs show that the slopes of Comparative examples are mild and much less steeper than those of the Examples. This demonstrates that there is a large difference between the trend of the Comparative examples and that of the Examples. Therefore, the significant difference in the data trends demonstrates the unexpectedly improved results of the present invention as recited in the claims.

(2) Applicants respectfully submit that the present invention as recited in the claims would not have been obvious over Hamrock in view of Sano and Funatsu because it would not have been obvious to one of ordinary skill in the art at the time of the present invention to combine the teachings of Hamrock and Funatsu.

Hamrock discloses the necessity of a secondary cell having excellent cycle properties at room temperature so as to allow for operation and reservation of the cell under the state where the possibility of explosion of the cell due to thermorunaway is minimized. (Col. 1, lines 41-65). By contrast, Funatsu teaches the improvement of discharge capacity during repeated charge/discharge operation at a temperature below room temperature. (Col. 3, lines 7-20).

In other words, Hamrock teaches cycle performance at room temperature and high temperature, and Funatsu teaches the improvement of discharge capacity below room temperature. Thus, it would not have been obvious at the time of the present invention for a person having ordinary skill in the art to combine the teachings of Hamrock with the teachings of Funatsu.

(3) Applicants respectfully submit that the present invention as recited in the claims would not have been obvious over Hamrock in view of Sano and Funatsu because it would not

have been obvious to one of ordinary skill in the art at the time of the present invention to combine the teachings of Sano and Funatsu.

Sano teaches that it is preferable to use an organic solvent having a boiling point of 170 °C or more. (See paragraph 42.) This is because a battery cell taught by Sano is subjected to high temperature. Thus, battery cells using DME (dimethoxy ethane) that have a boiling point below 170 °C are used in Comparative Examples in Table 2 of Sano. The battery cells using DME (Comparative Examples 2, 3, 4 and 6) show deteriorated performance.

By contrast, Funatsu teaches electrolyte solutions that are excellent in battery performance over a wide temperature range, especially at a low temperature. And Funatsu indicates that DME is the most preferable linear ether solvent. (Col. 6, lines 26-35). This is because DME is a low boiler. And all linear ethers exemplified in column 6, lines 26-35 of Funatsu are also low boilers, which do not have the structure recited in claim 1 of the present specification. Sano teaches that a low boiler is not preferable and Funatsu teaches that a low boiler is preferable. Thus, when reviewing the references as a whole, it would not have been obvious to one of ordinary skill in the art to combine the teachings of Sano and Funatsu.

New Claims

Claims 6-10 are newly added. Support for claims 6 and 9 is in the specification at, e.g., page 18, lines 18-21. Support for claim 7 is in the specification at, e.g., page 5, lines 21-24. Support for claims 8 and 10 is in the specification at, e.g., page 7, lines 4-13.)

For at least the foregoing reasons, claims 1 and 3-5 are patentable over the cited references. Accordingly, withdrawal of the rejections of claims 1 and 3-5 is hereby solicited.

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Response under 37 C.F.R. §1.114
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In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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Attachment: Declaration Under 37 C.F.R. § 1.132